

1. Method for adjusting the data transmission rate in a fieldbus system which is suitable to control safety-critical processes and which comprises at least one subscriber connected to a fieldbus, wherein in a first phase the subscriber/subscribers log on at a unit (central unit) centrally connected to the fieldbus with a first low data transmission rate; in a second phase the central unit sets the data transmission rate at the subscriber/subscribers to a predetermined higher second value; in a third phase the subscriber/subscribers log on again at the central unit with a higher data transmission rate; and the central unit shuts down the fieldbus if it detects a deviation of the number of subscribers logged on in the first and the third phase..
2. Method according to claim 1, wherein the first phase is started with switching on the fieldbus system.
3. Method according to claim 1, wherein in the second phase the central unit transmits data telegrams to all subscribers, the data telegrams comprising the instruction to switch the data transmission rate to the second value.
4. Method according to claim 1, wherein the central unit terminates the third phase when a predetermined time period has lapsed since the last log-on of one of the subscribers without a new log-on of one of the subscribers.

5. Method according to claim 1, wherein the first value of the data transmission rate is a standard transmission rate and the second value corresponds to the target value of the fieldbus system.
6. Method according to claim 1, wherein a new subscriber being connected to the fieldbus after termination of the third phase detects the data transmission rate on the fieldbus and logs on at the central unit with this data transmission rate.
7. Fieldbus system for controlling safety-critical processes, comprising a fieldbus to which at least one subscriber is connected, a central unit communicating with the subscribers via the fieldbus and having a switching device for centrally switching the data transmission rate on the fieldbus and at the subscribers from a first low value to a second higher value wherein the central unit comprises:
  - a first memory unit which stores the first and second values of the data transmission rate;
  - a second and a third memory unit for storing log-on data, the log-on data being supplied by the subscribers connected to the fieldbus; and
  - a comparator device which compares the log-on data stored in the second and the third memory unit, the central unit performing a shut-down of the fieldbus in case of an inconsistency.
8. Fieldbus system according to claim 7, wherein the central unit comprises a time measuring device which is connected

to the comparator device and which initiates the comparison after the lapse of a predetermined time period since the data transmission rate has been set to a higher value.

9. Fieldbus system according to claim 7, wherein the fieldbus is a serial bus.
10. Fieldbus system according to claim 7, wherein the fieldbus is a CAN-bus.
11. Fieldbus system according to claim 7, wherein the subscriber comprises a detection device for detecting the data transmission rate on the fieldbus and for adjusting the data transmission rate of the subscriber in response thereto.

PCT Claims originally filed

1. Method for adjusting the data transmission rate in a fieldbus system (10) which is suitable to control safety-critical processes and which comprises at least one subscriber (12, 14) connected to a fieldbus (20), characterized in that in a first phase the subscriber/subscribers log on at a unit (30/central unit) centrally connected to the fieldbus with a first low data transmission rate; and in a second phase the central unit (30) sets the data transmission rate at the subscriber/subscribers (12, 14) to a predetermined higher second value.
2. Method according to claim 1, characterized in that the subscriber/subscribers (12, 14) log on again at the central unit with a higher data transmission rate in a third phase; and the central unit (30) shuts down the fieldbus (20) if it detects a deviation of the number of subscribers (12, 14) logged on in the first and the third phase.
3. Method according to claim 1 or 2, characterized in that the first phase is started with switching on the fieldbus system (10).
4. Method according to claim 1, 2 or 3, characterized in that in the second phase the central unit (30) transmits data telegrams to all subscribers (12, 14), the data telegrams comprising the instruction to switch the data transmission rate to the second value.

5. Method according to any of the preceding claims, characterized in that the central unit (30) terminates the third phase when a predetermined time period has lapsed since the last log-on of one of the subscribers (12, 14) without a new log-on of one of the subscribers.
6. Method according to any of the preceding claims, characterized in that the first value of the data transmission rate is a standard transmission rate and the second value corresponds to the target value of the fieldbus system.
7. Method according to any of the preceding claims, characterized in that a new subscriber (12, 14) being connected to the fieldbus (20) after termination of the third phase detects the data transmission rate on the fieldbus (20) and logs on at the central unit (30) with this data transmission rate.
8. Fieldbus system for controlling safety-critical processes, comprising a fieldbus (20) to which at least one subscriber (12, 14) is connected, characterized in that a central unit (30) is provided which communicates with the subscribers (12, 14) via the fieldbus (20) and comprises a switching device (33) for centrally switching the data transmission rate on the fieldbus and at the subscribers from a first low value to a second higher value.
9. Fieldbus system according to claim 8, characterized in that the central unit comprises a first memory unit (35) which stores the first and second values of the data transmission rate.

10. Fieldbus system according to claim 8 or 9, characterized in that the central unit (30) comprises a second and a third memory unit (36, 37) for storing log-on data, the log-on data being supplied by the subscribers (12, 14) connected to the fieldbus (20).
11. Fieldbus system according to claim 10, characterized in that the central unit (30) comprises a comparator device (38) which compares the log-on data stored in the second and the third memory unit (36, 37), the central unit (30) performing a shut-down of the fieldbus in case of an inconsistency.
12. Fieldbus system according to claim 11, characterized in that the central unit (30) comprises a time measuring device (39) which is connected to the comparator device (38) and which initiates the comparison after the lapse of a predetermined time period since the data transmission rate has been set to a higher value.
13. Fieldbus system according to any of claims 8 through 12, characterized in that the fieldbus (20) is a serial bus.
14. Fieldbus system according to any of claims 8 through 13, characterized in that the fieldbus (20) is a CAN-bus (11).
15. Fieldbus system according to any of claims 8 through 14, characterized in that the subscriber (12, 14) comprises a detection device (40) for detecting the data transmission rate on the fieldbus and for adjusting the data transmission rate of the subscriber (12, 14) in response thereto.